

***ACTUARIAL
SECTION***



Employee Benefits, Actuarial & Investment Consulting

ACTUARIAL SECTION

Actuary's Certification Letter

December 7, 2018

Board of Trustees
Employees' Retirement System of Baltimore County
400 Washington Avenue
Towson, Maryland 21204

Re: Actuarial Certification for the June 30, 2018 Financial Report

Members of the Board:

The following sets forth the actuarial information for the June 30, 2018 Comprehensive Annual Financial Report (CAFR) for the Employees' Retirement System of Baltimore County, Maryland. The valuation was conducted as of July 1, 2017 and the results were rolled forward to June 30, 2018 for financial reporting purposes. Valuations are conducted annually. The accounting results are based on participant and asset information submitted by the County. We have reviewed this data for reasonableness and consistency with prior reports, but we have not performed an audit.

We prepared the following schedules for Plans A and B:

Actuarial Section

1. Net Pension Liability of the County
2. Changes in the County's Net Pension Liability and Related Ratios
3. Schedule of County Contributions
4. Changes in the Net Pension Liability
5. Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions
6. Components of County's Pension Expense for the Fiscal Year Ended June 30, 2018
7. Schedule of Differences between Projected and Actual Earnings on Pension Plan Investments
8. Schedule of Differences between Expected and Actual Experience
9. Schedule of Changes of Assumptions
10. Schedule of Active Member Valuation Data
11. Schedule of Retiree and Beneficiary Data
12. Solvency Test
13. Change in Unfunded Accrued Liability
14. Allocation of Amortization Bases

Statistical Section

15. Retirees and Beneficiaries - Distribution of Members by Type of Retirement
16. Retirees and Beneficiaries - Distribution to Members by Option Selected
17. Schedule of Participating Employers



Assumptions

The assumptions and methods used to determine the Actuarially Determined Contribution (ADC) and the preparation of the financial reporting under GASB 67/68 comply with the Actuarial Standards of Practice (ASOPs). These assumptions are based on the 2011 experience study. The System's overall funding objective is to accumulate sufficient assets over time to meet its long-term benefit obligations as they become due.

The methods, assumptions, and participant data used are detailed in the January 1, 2018 actuarial valuation report with the exception of the actuarial cost method. These calculations are based on the Entry Age Normal cost method as required by GASB67. The calculation of the Actuarially Determined Contribution for fiscal year ended June 30, 2018 is contained in the July 1, 2016 actuarial valuation report.

Kevin Binder is a Fellow of the Society of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. Bolton Partners, Inc. is independent of Baltimore County Government. We are not aware of any relationship or interest that would impair the objectivity of our work. The Actuarial Certification at the end of the January 1, 2018 actuarial valuation report contains other important information to understand about this valuation

Respectfully submitted,

Kevin Binder, FSA, EA, MAAA

Jordan McClane, ASA, EA

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods

ASSUMPTIONS

Interest Rate: 6.375% per annum, compounded annually, lowered from 6.75% in the prior valuation

Inflation: 3.0% per year.

Salary Increase: Representative rates are as follows:

Age	Annual Rates of Salary Increase		
	Fiscal Year 2014 – Fiscal Year 2016		Fiscal Year 2017 and thereafter
	General Employees, Correctional Officers and Deputy Sheriffs	Police Officers and Firefighters	All Members
25	6.40%	6.55%	6.55%
30	4.90	5.05	5.05
35	3.90	4.05	4.05
40	3.40	3.55	3.55
45	2.90	3.05	3.05
50	2.40	2.55	3.00
55	1.90	2.30	3.00
60	1.90	2.30	3.00
65	1.90	2.30	3.00

The effect of these assumptions is illustrated by the following examples: The age-based rates shown above produce an effective annual average increase of 4.1% over a 27-year career for a Police Officer/Firefighter hired at age 25, and 3.5% over a 30-year career for a General Employee hired at age 30.

Future Expenses: The assumed interest rate is gross of the anticipated future administrative expenses of the fund. All administrative and operating expenses of the System are included in the normal cost.

Loading or Contingency Reserves: None

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Illustrative Rates of Separation from Service (adopted as of June 30, 2007)

Age	Plan A (Hired Before 7/01/2007)							
	Withdrawal			Disability		Death		
	Refund Before 10 Years of Service	Refund After 10 Years of Service	Termination Benefit After 10 Years of Service			Ordinary		
				Ordinary	Accidental	Males	Females	Accidental
General Employees, Correctional Officers and Deputy Sheriffs								
20	12.184%			0.027%	0.002%	0.050%	0.014%	0.002%
25	9.450			0.038	0.002	0.049	0.013	0.001
30	7.245	1.631%	0.720%	0.065	0.005	0.047	0.020	0.001
35	6.930	1.215	0.720	0.109	0.005	0.055	0.034	0.001
40	6.930	1.160	0.720	0.190	0.007	0.074	0.045	0.002
45	6.930	1.103	0.810	0.271	0.012	0.109	0.071	0.003
50	5.040	0.349	0.900	0.380	0.014	0.169	0.112	0.005
55	3.780	0.660	1.500	0.461	0.017	0.279	0.162	0.008
60				0.461	0.021	0.529	0.259	0.014
64				0.461	0.021	0.895	0.476	0.020
65				0.461	0.021	1.014	0.561	0.022
69				0.461	0.021	1.608	1.000	0.032
Police Officers								
20	5.625%			0.023%	0.090%	0.028%	0.008%	0.008%
25	2.925			0.023	0.112	0.027	0.007	0.012
30	2.700	0.225%	0.309%	0.028	0.136	0.026	0.011	0.016
35	1.800	0.150	0.189	0.106	0.192	0.031	0.019	0.024
40	1.350	0.090	0.117	0.106	0.107	0.041	0.025	0.036
45	1.350	0.090	0.066	0.106	0.202	0.060	0.040	0.052
50	0.900	0.090	0.036	0.149	0.371	0.094	0.062	0.084
55	0.562	0.090	0.009	0.553	0.660	0.155	0.090	0.140
59				0.553	1.063	0.257	0.128	0.240
60				0.553	1.063	0.294	0.144	0.272
64				0.553	1.063	0.497	0.265	0.400
Firefighters								
20	15.000%			0.046%	0.017%	0.028%	0.008%	0.008%
25	7.800			0.046	0.021	0.027	0.007	0.012
30	7.200	0.750%	1.030%	0.056	0.026	0.026	0.011	0.016
35	4.800	0.500	0.630	0.212	0.036	0.031	0.019	0.024
40	3.600	0.300	0.390	0.212	0.050	0.041	0.025	0.036
45	3.600	0.300	0.220	0.212	0.093	0.060	0.040	0.052
50	2.400	0.300	0.120	0.298	0.173	0.094	0.062	0.084
55	1.500	0.300	0.030	0.106	0.306	0.155	0.090	0.140
59	0.300	0.300	0.010	0.106	0.344	0.257	0.128	0.240
60				0.106	0.344	0.294	0.144	0.272
64				0.106	0.344	0.497	0.265	0.400

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Illustrative Rates of Separation from Service (adopted as of June 30, 2007)

Age	Plan B (Hired After 6/30/2007)							
	Withdrawal			Disability		Death		
	Refund Before 10 Years of Service	Refund After 10 Years of Service	Termination Benefit After 10 Years of Service			Ordinary		
				Ordinary	Accidental	Males	Females	Accidental
General Employees, Correctional Officers and Deputy Sheriffs								
20	15.225%			0.032%	0.003%	0.050%	0.014%	0.002%
25	11.813			0.044	0.003	0.049	0.013	0.001
30	9.056	1.688%	0.600%	0.077	0.006	0.047	0.020	0.001
35	8.663	1.613	0.600	0.128	0.006	0.055	0.034	0.001
40	8.663	1.538	0.600	0.224	0.010	0.074	0.045	0.002
45	8.663	1.462	0.675	0.319	0.016	0.109	0.071	0.003
50	6.300	1.388	0.750	0.446	0.019	0.169	0.112	0.005
55	4.725	1.313	0.750	0.542	0.022	0.279	0.162	0.008
60	3.938	1.237	0.750	0.542	0.028	0.529	0.259	0.014
64	3.308	1.178	0.750	0.542	0.028	0.895	0.476	0.020
65	3.150	1.162	0.750	0.542	0.028	1.014	0.561	0.022
69				0.542	0.028	1.608	1.000	0.032
Police Officers								
20	7.500%			0.047%	0.060%	0.056%	0.015%	0.008%
25	3.900			0.047	0.075	0.054	0.014	0.012
30	3.600	0.750%	0.515%	0.056	0.090	0.052	0.022	0.016
35	2.400	0.500	0.315	0.213	0.128	0.061	0.038	0.024
40	1.800	0.300	0.195	0.213	0.218	0.082	0.050	0.036
45	1.800	0.300	0.110	0.213	0.412	0.121	0.079	0.052
50	1.200	0.300	0.060	0.298	0.758	0.188	0.124	0.084
55	0.750	0.300	0.015	1.105	1.350	0.310	0.180	0.140
59	0.150	0.300	0.005	1.105	2.175	0.514	0.255	0.240
60				1.105	2.175	0.588	0.288	0.272
64				1.105	2.175	0.994	0.529	0.400
Firefighters								
20	5.000%			0.047%	0.045%	0.056%	0.015%	0.008%
25	2.600			0.047	0.056	0.054	0.014	0.012
30	2.400	0.750%	0.515%	0.056	0.068	0.052	0.022	0.016
35	1.600	0.500	0.315	0.213	0.095	0.061	0.038	0.024
40	1.200	0.300	0.195	0.213	0.131	0.082	0.050	0.036
45	1.200	0.300	0.110	0.213	0.247	0.121	0.079	0.052
50	0.800	0.300	0.060	0.298	0.454	0.188	0.124	0.084
55	0.500	0.300	0.015	1.105	0.810	0.310	0.180	0.140
59	0.100	0.300	0.005	1.105	0.910	0.514	0.255	0.240
60				1.105	0.910	0.588	0.288	0.272
64				1.105	0.910	0.994	0.529	0.400

ACTUARIAL SECTION

Summary of Actuarial Assumptions and Methods, continued Illustrative Retirement Rates for General Employees

Plan A (Members before July 1, 2007)															Plan B (Members after June 30, 2007)
Age	Early Retirement (Age 55 with 20 Years)	Normal Retirement (Age 60 and 5 Years, or 30 Years) ¹										Front DROP Retirement			
		Under Age 60 at June 30, 2007					30 Years or Age 65 ² with 5 Years of Service			Age 55 and Rule of 85, but not in Front DROP		Under 5 Years of DROP Participa- tion	5 – 9 Years of DROP Participa- tion		
		5-9 Years of Service		10-19 Years of Service		20-29 Years of Service Without Rule of 85		Not DROP		Will DROP				Not DROP	
		Not DROP	Will DROP	Not DROP	Will DROP	Not DROP	Will DROP	Not DROP	Will DROP	Not DROP	Will DROP				
45															
46															
47															
48															
49															
50															
51															
52															
53															
54															
55	13.89%											20.00%			11.05%
56	4.39											20.00			11.05
57	2.93											20.00			11.05
58	4.68											20.00			11.05
59	6.58											20.00			11.05
60		4.00%	1.50%									20.00	10.00%		11.05
61		4.00	1.50									20.00	10.00	5.00%	11.05
62		4.00	1.50									25.00	20.00	10.00	12.71
63		4.00	1.50									25.00	20.00	15.00	23.11
64		4.00	1.50									20.00	00.00	20.00	16.48
65		4.00	1.50									20.00	00.00	25.00	18.69
66												25.00	20.00	30.00	30.29
67												20.00	00.00	35.00	25.76
68												20.00	00.00	40.00	24.44
69												20.00	00.00	45.00	23.11
70												20.00	00.00	50.00	22.01
												100.00	100.00	100.00	100.00

1. Members not meeting DROP entry requirements by age 65 are assumed to retire at the unreduced rates shown above. Members who meet the DROP entry requirements by age 65 are assumed to (a) retire at the reduced rates shown above prior to entering the DROP; (b) 35% of members enter the DROP as soon as they are eligible; and (c) retire normally (5%) or with DROP benefits (95%) at the DROP retirement rates shown based on DROP participation service. The DROP retirement rate becomes 100% upon completion of ten years of DROP participation, or attainment of age 70, whichever occurs first.

2. Substitute 60 for 65 if the member was age 60 or older on or before 6/30/2007.

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Illustrative Retirement Rates for Correctional Officers and Deputy Sheriffs

Age	Plan A (Members hired before 7/01/2007) ¹						Plan B (Hired After 6/30/2007)
	Age 60 with 5-9 Years of Service	Age 60 with 10-19 Years of Service		20-26 Years of Service		27 Years of Service	Retirement (Age 67 & 10 Years or 25 Years)
	Will Not be DROP Eligible	Will Not be DROP Eligible	Will be DROP Eligible	Will Not be DROP Eligible	Will be DROP Eligible ²	Will be DROP Eligible	
40				3.39%	2.54%		
41				3.39	2.54		
42				3.39	2.54		
43				3.39	2.54		
44				3.39	2.54		
45				3.39	2.54	17.19%	14.95%
46				3.39	2.54	17.19	14.95
47				3.39	2.54	17.19	14.95
48				3.39	2.54	17.19	14.95
49				3.39	2.54	17.19	14.95
50				3.39	2.54	17.19	14.95
51				3.39	2.54	17.19	14.95
52				3.39	2.54	17.19	14.95
53				3.39	2.54	17.19	14.95
54				3.39	2.54	17.19	14.95
55				3.39	2.54	17.19	14.95
56				3.39	2.54	17.19	14.95
57				3.39	2.54	17.19	14.95
58				3.39	2.54	17.19	14.95
59				3.39	2.54	17.19	14.95
60	4.00%	10.00 %	7.50%	3.39	2.54	17.19	14.95
61	4.00	12.00	9.00	5.97	4.48	19.77	17.19
62	4.00	14.00	10.50	22.17	16.62	35.97	31.27
63	4.00	16.00	12.00	11.85	8.88	25.65	22.30
64	4.00	18.00	13.50	15.28	11.46	29.08	25.29
65	4.00	20.00	15.00	27.59	20.69	41.14	40.99
66	4.00	22.00	16.50	20.54	15.40	34.39	34.86
67	4.00	24.00	18.00	18.47	13.85	32.27	33.06
68	4.00	26.00	19.50	16.41	12.31	30.21	31.27
69	4.00	28.00	21.00	14.69	11.01	28.49	29.77
70	100.00	100.00	100.00	100.00	100.00	100.00	100.00

- Members meeting the service requirement for the DROP by age 70 are assumed to retire at the reduced rates shown above prior to eligibility. Members not qualifying for the DROP are assumed to retire at the unreduced retirement rates shown above. An additional 20% is applied at the point when a member is first eligible to retire under the DROP. Also, an additional 25% is applied at the point when a member first reaches the 25-year service point due to the added health care subsidy. 95% of eligible members are assumed to elect the DROP.
- Members with 20-24 years and 26 years of service retire at 20% per year.

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Illustrative Retirement Rates for Police Officers

Age	Plan A (Members hired before 7/01/2007) ¹					Plan B (Hired After 6/30/2007)	
	Age 55 with 5-9 Years of Service	Age 55 with 10-19 Years of Service		20 Years of Service			
		Will Not be DROP Eligible	Will Not be DROP Eligible	Will be DROP Eligible	Will Not be DROP Eligible ²		Will be DROP Eligible ³
40				5.16%	3.87%		
41				5.21	3.91		
42				5.26	3.95		
43				5.31	3.98		
44				5.34	4.01		
45				5.41	4.06	9.41%	
46				5.47	4.10	9.47	
47				5.56	4.17	9.56	
48				5.67	4.25	9.67	
49				5.78	4.34	9.78	
50				5.91	4.43	9.91	
51				6.05	4.54	10.05	
52				6.23	4.67	10.23	
53				6.44	4.83	10.44	
54				6.69	5.02	10.69	
55	3.00%	25.00%	18.75%	15.30	11.48	19.30	
56	3.00	30.00	22.50	13.79	10.34	17.79	
57	3.00	35.00	26.25	5.86	4.40	9.86	
58	3.00	40.00	30.00	6.07	4.55	10.07	
59	3.00	45.00	33.75	6.41	4.81	10.41	
60	3.00	50.00	37.50	95.00	71.25	95.00	
61	3.00	55.00	41.25	40.00	30.00	40.00	
62	3.00	60.00	45.00	75.00	56.25	75.00	
63	3.00	65.00	48.75	50.00	37.50	50.00	
64	3.00	70.00	52.50	50.00	37.50	50.00	
65	100.00	100.00	100.00	100.00	100.00	100.00	

- Members meeting the service requirement for the DROP by age 65 are assumed to retire at the reduced rates shown above prior to eligibility. Members not qualifying for the DROP are assumed to retire at the unreduced retirement rates shown above. An additional 10% (5% if under age 50) is applied at the point when a member is first eligible to retire under the Back DROP. Also, an additional 10% (2% if age 45 or older) is applied at the point when a member first reaches the 25-year service point due to the added health care subsidy. 80% of eligible members are assumed to elect the DROP.
- Members age 45 and older with 27 years of service retire at 50% of the rates shown, plus an additional 5%. Members age 60 and age 60 with over 27 years of service are assumed to retire at a rate of 50% per year.
- Members age 45-49 with 20-24 years of service are assumed to retire at a rate of 3% per year. Members under age 50 with 25 years of service retire at 20% of the rates shown, plus an additional 2%.

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Illustrative Retirement Rates for Firefighters

Age	Plan A (Members hired before 7/01/2007) ¹						Plan B (Hired After 6/30/2007)
	Age 60 with 5-9 Years of Service	Age 60 with 10-19 Years of Service	Age 50 with 20-24 Years of Service		25 Years of Service		Retirement (Age 67 & 10 Years or 25 Years)
	Will Not be DROP Eligible	Will Not be DROP Eligible	Will Not be DROP Eligible	Will be DROP Eligible	Will Not be DROP Eligible ²	Will be DROP Eligible ³	
44					12.00%	9.00%	
45					12.00	9.00	
46					12.00	9.00	
47					12.00	9.00	
48					12.00	9.00	
49					12.00	9.00	12.00%
50			2.00%	1.50%	10.25	7.69	10.25
51			2.00	1.50	10.40	7.80	10.40
52			2.00	1.50	10.58	7.94	10.58
53			2.00	1.50	10.80	8.10	10.80
54			2.00	1.50	11.05	7.94	11.05
55			2.00	1.50	19.89	7.94	19.89
56			2.00	1.50	18.32	7.94	18.32
57			2.00	1.50	10.10	7.94	10.10
58			2.00	1.50	10.31	7.94	10.31
59			2.00	1.50	10.65	7.94	10.65
60	4.00%	10.00%	2.00	1.50	85.00	7.94	85.00
61	4.00	12.00	2.00	1.50	35.00	7.94	35.00
62	4.00	14.00	2.00	1.50	60.00	7.94	60.00
63	4.00	16.00	2.00	1.50	40.00	7.94	40.00
64	4.00	18.00	2.00	1.50	50.00	7.94	50.00
65	100.00	100.00	100.00	100.00	100.00	7.94	100.00

- Members meeting the service requirement for the DROP by age 65 are assumed to retire at the reduced rates shown above prior to eligibility. Members not qualifying for the DROP are assumed to retire at the unreduced retirement rates shown above. An additional 10% is applied at the point when a member is first eligible to retire under the DROP. Also, an additional 10% (5% if age 45-49) is applied at the point when a member first reaches the 25-year service point due to the added health care subsidy. 85% of eligible members are assumed to elect the DROP.
- Members with over 32 years of service retire at 200% of the rates shown.
- Members age 45-49 with 25 years of service retire at 50% of the rates shown, plus an additional 5%.

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Death After Retirement: The mortality for service retirements and dependent beneficiaries is 108% of the RP-2000 Healthy Annuitant Table for males, projected to 2027 with Scale AA and 100% of the RP-2000 Healthy Annuitant Table for females, projected to 2027 with Scale AA. For disability retirements, the mortality tables are the RP-2000 Disabled Annuitant Tables, projected to 2027 with Scale AA. Illustrative rates are shown below:

Age	Annual Rates of Mortality			
	Service Pensioners		Disability Pensioners	
	Males	Females	Males	Females
45	0.114%	0.073%	1.585%	0.482%
50	0.354	0.148	1.774	0.726
55	0.380	0.284	2.112	1.332
60	0.573	0.542	2.720	1.908
65	0.990	0.905	3.429	2.448
70	1.595	1.462	4.161	3.287
75	2.792	2.263	5.609	4.205
80	5.300	3.795	8.338	5.982
85	9.895	6.583	11.714	8.518

Marital Status: 90% of active Police Officers and Firefighters are assumed to be married. For all other employees, 90% of active males and 50% of active females are assumed to be married. In all cases, it is assumed that the female spouse is 3 years younger than the male spouse.

Credit for Unused Sick Leave: For members entitled to receive credit for unused sick leave, it was assumed that each member will accumulate such credit as follows:

Supervisory, management and confidential (SMC) members, other than Firefighters	$\frac{3}{4}$ year
Firefighters including SMC members	1 year
Police Officers	$\frac{1}{2}$ year
Employees other than Police Officers and Firefighters, excluding SMC members	$\frac{1}{2}$ year

— ACTUARIAL SECTION —

Summary of Actuarial Assumptions and Methods, continued

Actuarial Cost Method: Projected Unit Credit. Changes in benefits and assumptions and gains or losses are amortized over 30 years with payments that increase by 3% per annum.

Asset Valuation Method: A ten-year moving average fair value of assets that spreads the difference between the actual investment income and the expected income on the fair value (based on the valuation interest rate) over a period of ten years. For purposes of this calculation, the gain/(loss) is defined as the difference between the actual and the expected return on the fair value of assets. There is no corridor limiting the valuation assets to a certain percentage of the fair value.

Liability Due to Assets in Post-Retirement Increase Fund: Liabilities for retirees and beneficiaries include the value of assets in the Post-Retirement Increase Fund.

Payroll Growth: 3% per annum, compounded annually.

Part-Time Employees: For valuation purposes, all part-time County employees are assumed to be full-time. All part-time Agency employees are assumed to be 50% of full-time equivalence.

Data: The valuation is based on members of the System as of June 30, 2017 and does not take into account future members. All census data was supplied by the County and was subject to reasonable consistency checks.

— ACTUARIAL SECTION —

SCHEDULE OF ACTIVE MEMBER VALUATION DATA

GENERAL EMPLOYEES – THE SYSTEM

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2009	5	6,458	\$276,789,524	\$42,860	2.2%	(1.4)%
2010	5	6,336	282,299,161	44,555	4.0	1.1
2011	5	6,248	285,485,138	45,692	2.6	3.6
2012	5	5,893	273,433,117	46,400	1.5	1.7
2013	5	5,916	277,270,227	46,868	1.0	1.8
2014	5	5,974	281,585,487	47,135	0.6	0.8
2015	5	6,170	290,549,549	47,091	(0.1)	0.1
2016	5	6,254	303,685,765	48,559	3.1	1.0
2017	5	6,280	317,642,385	50,580	4.2	1.6
2018	5	6,354	327,729,955	51,579	2.0	2.9

POLICE OFFICERS – THE SYSTEM

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2009	5	1,936	\$142,060,736	\$73,378	6.1%	(1.4)%
2010	5	1,927	144,883,413	75,186	2.5	1.1
2011	5	1,919	148,430,584	77,348	2.9	3.6
2012	5	1,833	140,236,837	76,507	(1.1)	1.7
2013	5	1,843	146,580,108	79,533	4.0	1.8
2014	5	1,819	146,728,596	80,664	1.4	2.1
2015	5	1,870	150,239,354	80,342	(0.4)	0.1
2016	5	1,852	153,813,966	83,053	3.4	1.0
2017	5	1,868	162,460,215	86,970	4.7	1.6
2018	5	1,890	161,181,034	85,281	(1.9)	2.9

— ACTUARIAL SECTION —

Schedule of Active Member Valuation Data, continued

FIREFIGHTERS – THE SYSTEM

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2009	5	985	\$68,906,384	\$69,956	4.8%	(1.4)%
2010	5	991	69,191,965	69,820	(0.2)	1.1
2011	5	1,013	71,676,716	70,757	1.3	3.6
2012	5	958	66,958,931	69,895	(1.2)	1.7
2013	5	939	68,076,750	72,499	3.7	1.8
2014	5	963	69,048,320	71,701	(1.1)	2.1
2015	5	978	69,354,780	70,915	(1.1)	0.1
2016	5	994	72,235,285	72,671	2.5	1.0
2017	5	1,011	78,620,633	77,765	7.0	1.6
2018	5	1,035	78,595,034	75,937	(2.4)	2.9

CORRECTIONAL OFFICERS AND DEPUTY SHERIFFS – THE SYSTEM

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2009	5	393	\$19,151,020	\$48,730	5.9%	(1.4)%
2010	5	379	18,750,737	49,474	1.5	1.1
2011	5	391	19,729,598	50,459	2.0	3.6
2012	5	398	21,024,482	52,825	4.7	1.7
2013	5	401	21,574,912	53,803	1.9	1.8
2014	5	397	21,311,072	53,680	(0.2)	2.1
2015	5	394	21,185,562	53,770	0.2	0.1
2016	5	425	22,924,402	53,940	0.3	1.0
2017	5	421	23,212,255	55,136	2.2	1.6
2018	5	415	23,060,078	55,566	0.8	2.9

— ACTUARIAL SECTION —

Schedule of Active Member Valuation Data, continued

ALL GROUPS – THE SYSTEM

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2009	5	9,772	\$506,907,664	\$51,873	3.5%	(1.4)%
2010	5	9,633	515,125,276	53,475	3.1	1.1
2011	5	9,571	525,322,036	54,887	2.6	3.6
2012	5	9,082	501,653,367	55,236	0.6	1.7
2013	5	9,099	513,501,997	56,435	2.2	1.8
2014	5	9,153	518,673,476	56,667	0.4	0.8
2015	5	9,412	531,329,245	56,452	(0.4)	0.1
2016	5	9,525	552,659,417	58,022	2.8	1.0
2017	5	9,580	581,935,488	60,745	4.7	1.6
2018	5	9,694	590,566,102	60,921	0.3	2.9

SCHEDULE OF ACTIVE MEMBER VALUATION DATA – PLAN A

GENERAL EMPLOYEES - PLAN A*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	3,891	\$200,020,320	\$51,406	N/A	2.1%
2015	5	3,602	188,735,135	52,397	1.9%	0.1
2016	5	3,325	183,185,133	55,093	5.1	1.0
2017	5	3,006	175,229,046	58,293	5.8	1.6
2018	5	2,750	167,148,407	60,781	4.3	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

— ACTUARIAL SECTION —

SCHEDULE OF ACTIVE MEMBER VALUATION DATA – PLAN A, continued POLICE OFFICERS – PLAN A*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	1,528	\$131,455,172	\$86,031	N/A	2.1%
2015	5	1,488	129,997,544	87,364	1.5%	0.1
2016	5	1,435	130,464,784	90,913	4.1	1.0
2017	5	1,357	132,892,757	97,931	7.7	1.6
2018	5	1,295	126,539,167	97,714	(0.2)	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

FIREFIGHTERS – PLAN A*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	676	\$56,214,397	\$83,157	N/A	2.1%
2015	5	640	53,820,307	84,094	1.1%	0.1
2016	5	603	53,148,984	88,141	4.8	1.0
2017	5	563	54,731,489	97,214	10.3	1.6
2018	5	516	50,686,571	98,230	1.0	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

CORRECTIONAL OFFICERS AND DEPUTY SHERIFFS – PLAN A*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	258	\$14,869,872	\$57,635	N/A	2.1%
2015	5	238	13,678,567	57,473	(0.3%)	0.1
2016	5	219	13,203,959	60,292	4.9	1.0
2017	5	200	12,441,204	62,206	3.2	1.6
2018	5	177	11,345,890	64,101	3.0	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

— ACTUARIAL SECTION —

SCHEDULE OF ACTIVE MEMBER VALUATION DATA – PLAN A, continued ALL GROUPS – PLAN A*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	6,353	\$402,559,762	\$63,365	N/A	2.1%
2015	5	5,968	386,231,553	64,717	2.1%	0.1
2016	5	5,582	380,002,860	68,076	5.2	1.0
2017	5	5,126	375,294,496	73,214	7.5	1.6
2018	5	4,738	355,720,034	75,078	2.5	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

SCHEDULE OF ACTIVE MEMBER VALUATION DATA – PLAN B GENERAL EMPLOYEES - PLAN B*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	2,083	\$81,565,167	\$39,158	N/A	2.1%
2015	5	2,568	101,814,414	39,647	1.3%	0.1%
2016	5	2,929	120,500,632	41,141	3.8	1.0
2017	5	3,274	142,413,339	43,498	5.7	1.6
2018	5	3,604	160,581,548	44,556	2.4	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

POLICE OFFICERS - PLAN B*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	291	\$15,273,425	\$52,486	N/A	2.1%
2015	5	382	20,241,810	52,989	1.0%	0.1
2016	5	417	23,349,182	55,993	5.7	1.0
2017	5	511	29,567,458	57,862	3.3	1.6
2018	5	595	34,641,867	58,222	0.6	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

— ACTUARIAL SECTION —

SCHEDULE OF ACTIVE MEMBER VALUATION DATA – PLAN B, continued

FIREFIGHTERS - PLAN B*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	287	\$12,833,923	\$44,718	N/A	2.1%
2015	5	338	15,534,473	45,960	2.8%	0.1
2016	5	391	19,086,301	48,814	6.2	1.0
2017	5	448	23,889,144	53,324	9.2	1.6
2018	5	519	27,908,464	53,774	0.8	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

CORRECTIONAL OFFICERS AND DEPUTY SHERIFFS - PLAN B*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	139	\$6,441,200	\$46,340	N/A	2.1%
2015	5	156	7,506,995	48,122	3.8%	0.1
2016	5	206	9,720,442	47,187	(1.9)	1.0
2017	5	221	10,771,051	48,738	3.3	1.6
2018	5	238	11,714,189	49,219	1.0	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

ALL GROUPS – PLAN B*

Valuation as of June 30	Participating Employers	Number of Active Members	Valuation Payroll	Average Salary	Percent Increase (Decrease)	CPI % Increase
2014	5	2,800	\$116,113,715	\$41,469	N/A	2.1%
2015	5	3,444	145,097,692	42,131	1.6%	0.1
2016	5	3,943	172,656,557	43,788	3.9	1.0
2017	5	4,454	206,640,992	46,394	6.0	1.6
2018	5	4,956	234,846,068	47,386	2.1	2.9

*Ten-year historical trend information is not available but will be compiled going forward.

— ACTUARIAL SECTION —

SCHEDULE OF RETIREE AND BENEFICIARY DATA – THE SYSTEM

Valuation as of June 30	Added to Rolls		Removed from Rolls		Rolls – End of Year		Percent Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2009	281	\$13,789,920	221	\$2,802,573	6,510	\$144,595,504	8.2%	\$22,211
2010	395	12,662,248	201	3,237,920	6,704	154,019,832	6.5	22,974
2011	303	12,530,487	235	3,946,193	6,772	162,604,126	5.6	24,011
2012	664	24,367,514	205	3,204,235	7,231	183,767,405	13.0	25,414
2013	380	14,175,414	229	3,181,871	7,382	194,760,948	6.0	26,383
2014	381	11,363,715	267	2,338,972	7,496	203,785,691	4.6	27,186
2015	363	12,015,865	246	3,800,294	7,613	212,001,262	4.0	27,847
2016	369	12,252,451	226	4,428,386	7,756	219,825,327	3.7	28,343
2017	457	15,475,435	247	4,189,937	7,966	231,110,825	5.1	29,012
2018	414	14,425,273	242	2,271,372	8,138	243,264,725	5.3	29,892

SCHEDULE OF RETIREE AND BENEFICIARY DATA – PLAN A

Valuation as of June 30	Added to Rolls		Removed from Rolls		Rolls – End of Year		Percent Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2009	281	\$13,789,920	221	\$2,802,573	6,510	\$144,595,504	8.2%	\$22,211
2010	395	12,662,248	201	3,237,920	6,704	154,019,832	6.5	22,974
2011	303	12,530,487	235	3,946,193	6,772	162,604,126	5.6	24,011
2012	664	24,367,514	205	3,204,235	7,231	183,767,405	13.0	25,414
2013	380	14,175,414	229	3,181,871	7,382	194,760,948	6.0	26,383
2014	381	11,363,715	267	2,338,972	7,496	203,785,691	4.6	27,186
2015	363	12,015,865	246	3,800,294	7,613	212,001,262	4.0	27,847
2016	367	12,169,536	226	4,428,386	7,754	219,742,412	3.7	28,339
2017	457	15,475,435	247	4,189,937	7,964	231,027,910	5.1	29,009
2018	409	14,337,208	242	2,271,372	8,131	243,093,746	5.2	29,897

SCHEDULE OF RETIREE AND BENEFICIARY DATA – PLAN B*

Valuation as of June 30	Added to Rolls		Removed from Rolls		Rolls – End of Year		Percent Increase In Annual Allowances	Average Annual Allowances
	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances		
2016	2	\$86,646	-	-	2	\$82,915	N/A	\$41,457
2017	-	-	-	-	2	82,915	0.0	41,457
2018	5	88,065	-	-	7	170,980	106.2	24,426

*Prior to FY 2016, there were no Plan B retirees.

— ACTUARIAL SECTION —

Solvency Test

Baltimore County's funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the system are level in concept and soundly executed, the system will pay all promised benefits when due – the ultimate test of financial soundness. Testing for level contribution rates is the long-term test.

A short conditions test is one means of checking a system's progress under its funding program. In a short condition test, the system's present assets (cash and investments) are compared with: (1) the liabilities for future benefits to present retired lives; (2) the liabilities for service already rendered by active members. In a system that has been following the discipline of level percent of payroll financing, the liabilities for future benefits to present retired lives (liability B) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability A & C) will be at least partially covered by the remainder of present assets. Generally, if the system has been using level cost financing, the funded portion of liability A & C will increase over time. This is the relationship between accrued liabilities and assets of the System over the last ten years:

The System

Valuation as of June 30	Accrued Liability for:			Actuarial Value of Assets	Portion of Accrued Liability Covered by Actuarial Value of Assets		
	(A) Active Member Contribution	(B) Retirees and Beneficiaries	(C) Active Member Employer Financed		(A)	(B)	(C)
2007 ⁽¹⁾	\$363,778,826	\$1,247,373,485	\$678,300,211	\$2,101,023,411	100.0%	100.0%	72.2%
2008 ⁽²⁾	391,743,335	1,307,885,347	791,713,328	2,191,623,378	100.0	100.0	62.1
2009 ⁽³⁾	417,514,605	1,359,000,212	823,155,619	2,143,616,137	100.0	100.0	44.6
2010 ⁽⁴⁾	447,377,958	1,446,963,230	851,674,652	2,196,914,646	100.0	100.0	35.5
2011	473,082,150	1,484,234,414	906,536,155	2,213,857,844	100.0	100.0	28.3
2012 ⁽⁵⁾	468,059,738	1,783,341,001	903,115,828	2,483,511,733	100.0	100.0	25.7
2013 ⁽⁶⁾	483,966,112	1,992,569,006	990,069,135	2,490,481,231	100.0	100.0	1.4
2014	490,356,233	2,041,957,711	1,113,950,591	2,517,944,853	100.0	99.3	0.0
2015 ⁽⁷⁾	513,180,004	2,153,486,824	1,167,591,591	2,553,596,803	100.0	94.7	0.0
2016 ⁽⁸⁾	533,502,719	2,296,643,507	1,317,362,524	2,698,256,578	100.0	94.3	0.0
2017	547,074,123	2,410,021,364	1,381,716,921	2,672,929,761	100.00	88.2	0.0

- (1) Assumption changes recommended in 2006 experience study were adopted, plus plan changes to all groups including implementation of DROP programs for general employees, correctional officers and deputy sheriffs.
- (2) Amortization period was changed to 30 years.
- (3) Actuarial Asset Method is revised to remove 14% Corridor around the Fair Value and the smoothing period was changed from 4 to 5 years. Salary increase rates for all members were reduced.
- (4) Actuarial Asset Method change: The Smoothing period was changed from 5 to 10 years.
- (5) Interest rate decreased from 7.875% to 7.25%, which was offset by the net proceeds from the Pension Obligation Bonds. In addition, the System also implemented the Retirement Incentive Plan early retirement window.
- (6) Interest rate decreased from 7.25% to 7.00% and assumption changes recommended in the 2011 experience study were adopted.
- (7) Interest rate decreased from 7.00% to 6.75%.
- (8) Interest rate decreased from 6.75% to 6.375%.

— ACTUARIAL SECTION —

Solvency Test, continued

Plan A*

Valuation as of June 30	Accrued Liability for:			Actuarial Value of Assets	Portion of Accrued Liability Covered by Actuarial Value of Assets		
	(A) Active Member Contribution	(B) Retirees and Beneficiaries	(C) Active Member Employer Financed		(A)	(B)	(C)
2014	\$461,795,813	\$2,041,957,711	\$1,103,649,784	\$2,485,014,469	100.0%	99.1%	0.0%
2015 ⁽⁷⁾	474,797,680	2,153,486,824	1,151,636,214	2,510,144,678	100.0	94.5	0.0
2016 ⁽⁸⁾	483,927,859	2,295,696,303	1,289,553,278	2,636,841,308	100.0	93.8	0.0
2017	483,474,933	2,409,134,316	2,594,283,037	2,594,283,037	100.0	87.6	0.0

(7) Interest rate decreased from 7.00% to 6.75%.

(8) Interest rate decreased from 6.75% to 6.375%.

Plan B*

Valuation as of June 30	Accrued Liability for:			Actuarial Value of Assets	Portion of Accrued Liability Covered by Actuarial Value of Assets		
	(A) Active Member Contribution	(B) Retirees and Beneficiaries	(C) Active Member Employer Financed		(A)	(B)	(C)
2014	\$28,380,420	-	\$10,300,807	\$32,930,384	100.0%	100.0%	44.2%
2015 ⁽⁷⁾	38,382,323	-	15,955,378	43,452,125	100.0	100.0	31.8
2016 ⁽⁸⁾	49,574,860	\$947,204	27,809,246	61,415,270	100.0	100.0	39.2
2017	63,599,190	887,048	39,856,586	78,646,724	100.0	100.0	35.5

(7) Interest rate decreased from 7.00% to 6.75%.

(8) Interest rate decreased from 6.75% to 6.375%.

*Ten-year historical trend information is not available but will be compiled going forward.

— ACTUARIAL SECTION —

Change in Unfunded Accrued Liability – The System As of July 1, 2017

<i>Reconciliation of Gain (Loss) in the Unfunded Accrued Liability:</i>	Amount
1. Unfunded Accrued Liability (UAL) at July 1, 2017	\$1,467,980,396
2. Interest Charge at 6.375% to July 1, 2018	93,583,750
3. Contributions Toward Unfunded Accrued Liability	81,565,662
4. Projected UAL at July 1, 2018 [(1) + (2) - (3)]	1,479,998,484
5. Expected Unfunded Accrued Liability at July 1, 2018 (Based on the 2016 Actuarial Valuation)	1,660,486,038
6. Actual (Gain)/Loss [(5) – (4)]	\$180,487,554

Plan A

<i>Reconciliation of Gain (Loss) in the Unfunded Accrued Liability:</i>	Amount
1. Unfunded Accrued Liability (UAL) at July 1, 2017	\$1,450,627,748
2. Interest Charge at 6.375% to July 1, 2018	92,477,519
3. Contributions Toward Unfunded Accrued Liability	80,601,493
4. Projected UAL at July 1, 2018 [(1) + (2) - (3)]	1,462,503,774
5. Expected Unfunded Accrued Liability at July 1, 2018 (Based on the 2016 Actuarial Valuation)	1,634,584,284
6. Actual (Gain)/Loss [(5) – (4)]	\$172,080,510

Plan B

<i>Reconciliation of Gain (Loss) in the Unfunded Accrued Liability:</i>	Amount
1. Unfunded Accrued Liability (UAL) at July 1, 2017	\$17,352,648
2. Interest Charge at 6.375% to July 1, 2018	1,106,231
3. Contributions Toward Unfunded Accrued Liability	964,169
4. Projected UAL at July 1, 2018 [(1) + (2) - (3)]	17,494,710
5. Expected Unfunded Accrued Liability at July 1, 2018 (Based on the 2016 Actuarial Valuation)	25,901,754
6. Actual (Gain)/Loss [(5) – (4)]	\$8,407,044

— ACTUARIAL SECTION —

Allocation of Amortization Bases For the Year Ended July 1, 2018

	Plan A	Plan B	The System	Amortization Period
2015 Fresh Start Employer Base	\$1,302,183,747	\$11,445,233	\$1,313,628,980	28 Years
2016 (Gain)/Loss	147,825,782	228,404	148,054,186	28 Years
2016 Change in assumptions	12,494,245	5,821,073	18,315,318	28 Years
2017 (Gain)/Loss	<u>172,080,510</u>	<u>8,407,044</u>	<u>180,487,554</u>	28 Years
Total	<u>\$1,634,584,284</u>	<u>\$25,901,754</u>	<u>\$1,660,486,038</u>	

ACTUARIAL SECTION

Summary of Plan Provisions

The Employees' Retirement System provides members the following benefits:

- Retirement Benefits
- Disability Benefits
- Death Benefits

ELIGIBILITY

Members are designated as classified or merit system employees, part-time employees, non-merit employees, elected officials, department heads, or agency employees. Merit system employees included full-time general employees, police officers, firefighters, deputy sheriffs and correctional officers. Agency employees include the Board of Education, the Board of Library Trustees, the Community College of Baltimore County and the Baltimore County Revenue Authority. Agency employees that are not eligible to participate in the Maryland State Retirement and Pension Systems are entitled to membership in the System.

System membership is compulsory for merit system employees as a condition of employment, except for those members who were hired at age 55 or over. Merit employees, exclusive of police officers and firefighters, are required to join the System within the first sixty days of employment. Police officers and firefighters are required to join the System as a condition of employment.

Part-time employees, non-merit employees, elected officials, department heads, merit system employees hired at age 55 or over, and agency employees have the option to join the system within sixty days of employment or forfeit the right to join the System.

Waived time is not eligible for buy back. However, in FY 2015, members hired prior to July 1, 2010 were provided a one-time opportunity to purchase their eligible waived service if they declared their intent by March 31, 2015 and purchased their waived service on or before June 30, 2015.

Members hired prior to July 1, 2007 are vested after five years of membership. System members hired on or after July 1, 2007 are vested after ten years of creditable service.

MEMBER CONTRIBUTIONS

Contribution rates for System members were negotiated with all employee groups based on a percentage of their salary. Effective July 1, 2017, contribution rates range as follows:

Classification	Contribution Rate as a % of Covered Payroll					
	Hired prior to July 1, 2007 (Range)	Hired from July 1, 2007 to June 30, 2011	Hired from July 1, 2011 to June 30, 2012	Hired from July 1, 2012 to June 30, 2014	Hired on or after July 1, 2014	
Elected Officials	13.85%	13.85%	13.85%	13.85%	13.85%	
Department Heads	9.25 - 10.00	10.50	10.50	10.50	10.50	
General Employees	6.75 - 7.25	7.00	7.00	7.00	7.00	
Correctional Officers	7.00 - 7.50	8.00	10.00	10.00	10.00	
Deputy Sheriffs	7.00 - 7.50	8.00	10.00	10.00	10.00	
Firefighters	9.00	9.00	10.00	10.00	10.00	
Fire Supervisory, Mgmt. and Confidential (SMC)	9.00	9.00	10.00	10.00	10.00	
Police Officers	9.00	9.00	9.00	9.00	10.00	
Police Supervisory, Mgmt. and Confidential (SMC)	9.00	9.00	9.00	10.00*	10.00*	

*Includes members who were appointed as Police SMC on or after July 1, 2012.

Interest is credited on member contributions at the rate of 5.0% per annum on the beginning of the fiscal year balance.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

MILITARY SERVICE CREDIT

Members hired prior to July 1, 2007, with five years of creditable service, or members hired on or after July 1, 2007, with ten years of creditable service are entitled to a military service credit on a year-for-year basis for up to a maximum of four years. No such service credit shall be granted to a member if the member has received credit for a period of military service under any other retirement system for which retirement benefits have been or will be received by the member. To apply, a member must bring their DD214 to the Retirement Office and complete an Application for Military Credit.

SICK LEAVE CREDIT

At the time of retirement, all members, except firefighters and Police SMC (Supervisory, Management and Confidential) receive one month of service credit for each 22 unused sick leave days. One additional month is granted if fractional days of sick leave total 11 or more. Firefighters and Police SMC receive one month of service credit for each 16 unused sick leave days. Sick leave may be used to determine service credit except for the following circumstances: death benefit, ordinary disability, and vesting.

RETIREMENT ALLOWANCE DATES

Normal Retirement for Service: Plan A (Members hired prior to July 1, 2007)

Normal retirement for service can be granted to general employees and appointed officials who have reached the age of 60 with 5 years of creditable service or attained 30 years of creditable service. A normal retirement for service can be granted to elected officials who have attained 16 years of creditable service or age 55 and attained 4 years of creditable service. An early service retirement can be granted to general employees who have reached the age of 55 and have attained 20 years of creditable service. A normal retirement for service can be granted to correctional officers and deputy sheriffs who have reached the age of 60 with 5 years of creditable service or have attained 20 years of creditable service. A normal retirement for service can be granted to firefighters at the age of 60 with 5 years of creditable service, age 50 with 20 years of creditable service, or 25 years creditable service regardless of age. A normal retirement for service can be granted to police officers who have reached the age of 55 or have attained 20 or more years of creditable service. The System does not have a mandatory retirement age requirement for general employees, deputy sheriffs and correctional officers. Firefighters and police officers must retire at age 65 unless approved for continuation of service by the Board annually.

Normal Retirement for Service: Plan B (Members hired on or after July 1, 2007)

Normal retirement for service can be granted to general employees and appointed officials who have reached the age of 67 with 10 years of creditable service or attained 35 years of creditable service. A normal retirement for service can be granted to elected officials who have attained 16 years of creditable service or age 55 and attained 4 years of creditable service. A normal retirement for service can be granted to correctional officers and deputy sheriffs who have reached the age of 67 with 10 years of creditable service or have attained 25 years of creditable service. A normal retirement for service can be granted to firefighters at the age of 60 with 10 years of creditable service or 30 years creditable service. A normal retirement for service can be granted to police officers who have reached the age of 60 with 10 years of creditable service or have attained 25 years of creditable service. The System does not have a mandatory retirement age requirement for general employees, deputy sheriffs and correctional officers. Firefighters and police officers must retire at age 65 unless approved for continuation of service by the Board on an annual basis.

Ordinary Disability Retirement may be granted to a member who can no longer perform their job due to a non-occupational related injury. A sworn police officer or firefighter, hired prior to July 1, 2007 must have five years of creditable service and be medically certified as incapacitated to continue performance of their duties. All other members must have 10 years of creditable service and be medically certified as incapacitated to continue performance of their duties.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

Accidental Disability Retirement may be granted to a member upon application who has been physically incapacitated for duty as a result of an occupational related injury. Accidental disabilities for all members are tiered based on the degree of disability (75%, 66.67%, or 50%) plus accumulated contributions.

Discontinued Service Retirement may be granted to a member whose employment has been discontinued through no fault of their own after completion of 25 years of creditable service or age 50 and 20 years of creditable service.

RETIREMENT ALLOWANCES

Retirement allowances are comprised of an annuity equal to the actuarial equivalent of the accumulated contributions plus a pension which together with the annuity shall provide a maximum allowance as provided for in the Code.

Normal Retirement for Service Allowance is granted as follows:

- (A) General employees (excluding appointed officials, correctional officers and part-time employees) hired prior to July 1, 2007, with 30 years of creditable service, or age 65 with 5 years of creditable service receive an allowance equal to 1/55th of the Average Final Compensation (AFC) times the number of years of creditable service. General employees hired prior to July 1, 2007 may retire at age 60 with at least 5 years of creditable service, however, such members will be granted a blended benefit. For creditable service earned prior to July 1, 2007, members will receive an allowance equal to 1/55th of AFC times the number of years of creditable service and for creditable service earned on or after July 1, 2007, members will receive an allowance equal to 1/70th of AFC times the number of years of creditable service. The AFC definition is determined by the employee's classification as the highest 12 or 36 consecutive months.

General employees (excluding appointed officials and correctional officers) hired on or after July 1, 2007, receive an allowance equal to 1/70th of the Average Final Compensation (AFC) times the number of years of creditable service. The AFC definition for general employees hired on or after July 1, 2007 is the annual earnable compensation for the highest 36 consecutive months.

Part-time employees earn creditable service on a proportionate basis equal to the time worked annually as compared to the standard work year.

Appointed officials receive an allowance equal to 2.5% of their AFC times the number of years of creditable service.

- (B) Elected officials receive an allowance equal to 5.0% of their AFC times the number of years of creditable service. Any Council member who becomes a member of the retirement system on or after February 1, 2010 may not receive a retirement allowance in excess of 60% of the member's AFC.
- (C) Firefighters receive an allowance equal to 2.5% times the years of creditable service up to 20 years plus 2% of AFC for each year of creditable service in excess of 20 years, and 3% of AFC for each year of creditable service in excess of 30 years for years beginning on or after July 1, 2007. Firefighters with less than 20 years of creditable service receive an allowance equal to 2% of AFC times years of creditable service. The 3% rate does not apply to service earned prior to July 1, 2007. AFC is defined as the annual earnable compensation during the 12 consecutive calendar months affording the highest average.
- (D) Police officers with 20 or more years of creditable service receive an allowance equal to 2.5% of AFC times years of creditable service up to 20 years plus 2% of AFC for each year of creditable service in excess of 20 years, and 3% of AFC for each year of creditable service in excess of 25 years for years beginning on or after July 1, 2007. The 3% rate does not apply to service earned prior to July 1, 2007. Police officers with less than 20 years of creditable service receive an allowance equal to 2% of AFC times years of creditable service. AFC is defined as the annual earnable compensation during the 12 consecutive calendar months affording the highest average.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

- (E) Correctional officers and deputy sheriffs with 20 or more years of creditable service receive an allowance equal to 2.5% of AFC times years of creditable service up to 20 years plus 2% of AFC for each year of creditable service in excess of 20 years. Correctional officers and deputy sheriffs hired prior to July 1, 2007, with less than 20 years of creditable service receive the same benefit as a general employee. Correctional officers and deputy sheriffs hired on or after July 1, 2007, with 25 years of creditable service receive an allowance equal to 1.43% of AFC times the number of years of creditable service.

Ordinary Disability Retirement Allowance

- (A) General employees, correctional officers and deputy sheriffs hired prior to July 1, 2007, receive an ordinary disability retirement allowance equal to 1.82% of AFC times the number of years of creditable service earned prior to July 1, 2007 and 1.43% for creditable service earned on or after July 1, 2007. General employees, correctional officers and deputy sheriffs hired on or after July 1, 2007, receive a retirement allowance equal to 1.43% of AFC times the number of years of creditable service. The minimum allowance is equal to 25% of AFC. The maximum allowance is equal to one-third of the members AFC. No member may receive a benefit in excess of that which they would have received at normal service retirement age. General employees, correctional officers and deputy sheriffs who are eligible for a normal service retirement and apply for an ordinary disability retirement may be required by the Board to accept a normal service retirement.
- (B) Firefighters and police officers receive an ordinary disability retirement allowance equal to 2.5% of AFC times the number of years of creditable service not in excess of 20 years, and 2% of AFC times the number of years of creditable service in excess of 20 years. The minimum retirement allowance for firefighters and police officers for an ordinary disability retirement allowance shall equal 50% of AFC. No member may receive a benefit in excess of that which they would have received at normal service retirement age.

RETIREMENT ALLOWANCE OPTIONS

Members may select the maximum retirement allowance or one of seven optional survivorship allowances. The selection of an option, excluding *Option 7*, reduces the maximum allowance. The options are as follows:

- Option 1.* Allows the member's undistributed accumulated contributions to be paid to the beneficiary in a lump sum if the member's death occurs prior to the complete payout of all member contributions.
- Option 2.* Allows 100% of the member's retirement allowance to continue to be paid to the beneficiary after the member's death.
- Option 3.* Allows 50% of the member's retirement allowance to continue to be paid to the beneficiary after the member's death.
- Option 4.* Allows any portion of the retirement allowance to continue to be paid to the beneficiary after the member's death.
- Option 5.* Allows 100% of the member's reduced retirement allowance to be paid to the beneficiary after the member's death. If the member becomes divorced from the beneficiary or the beneficiary dies before the retiree, upon notification to the Board of Trustees, the member's allowance will be increased to the maximum allowance described above. If after such death or divorce, the member wishes to select a new beneficiary and retirement option, the member may select *options 2, 3, 4, 5 or 6*. The retirement allowance will then be recomputed.
- Option 6.* Allows 50% of the member's reduced retirement allowance to be paid to the beneficiary after the member's death. If the member becomes divorced from the beneficiary or the beneficiary dies before the retiree, upon notification to the Board of Trustees, the member's allowance will be increased to the maximum allowance described above. If after such death or divorce, the member wishes to select a new beneficiary and retirement option, the member may select *options 2, 3, 4, 5 or 6*. The retirement allowance will then be recomputed.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

RETIREMENT ALLOWANCE OPTIONS, continued

Option 7. Allows 50% of the member's retirement allowance to continue to be paid to the original beneficiary at no cost to the employee. This option is available to employees who have completed at least 25 years of actual service as a sworn Baltimore County Police Officer or 25 years of actual service as a sworn Baltimore County firefighter. If after such death or divorce, the member wishes to select a new beneficiary and retirement option, the member may select *options 2, 3, 4, 5 or 6*. The retirement allowance will then be recomputed.

DEFERRED RETIREMENT OPTION PLAN (DROP)

Police Officers and Firefighters DROP

The County has adopted a Back DROP for police officers with at least 27 years of service and firefighters with at least 32 years of service, under which eligible active members may elect to receive a lump sum payment with a 6% bonus at retirement in exchange for a reduced monthly benefit for life. Election to participate in the DROP will be made at retirement. The DROP participant benefit will be calculated along with all other available options, and the member will then choose between the DROP benefit and the regular pension benefits provided by the County. The DROP participant monthly pension will be determined as of a date that is 3, 3½, 4, 4½ or 5 years prior to retirement date based on the plan provisions, the member's salary and service at that earlier date. The lump sum payment will be based on the accumulation of member contributions, monthly pension payments, interest earned in the DROP at the greater of the rate of return on the actuarial value of assets minus 50 basis points or the regular rate of interest (currently 5%), and any retiree COLAs after at least twelve months in the DROP. This program became effective with retirements that occurred on or after July 1, 2004. Police officers and firefighters hired on or after July 1, 2007 are not eligible to participate in the DROP.

Correctional Officers and Deputy Sheriffs Deferred Retirement Option Plan (DROP)

Effective July 1, 2010, a Back-DROP is offered to eligible correctional officers and deputy sheriffs hired prior to July 1, 2007. The Back-DROP program allows eligible correctional officers and deputy sheriffs to elect to receive a lump sum payment at retirement in exchange for a reduced monthly benefit. The DROP period is 3, 3½, 4, 4½ or 5 years prior to retirement date based on the plan provisions, the member's salary and service at that earlier date. Eligibility is based on at least 27 years of service. The lump sum payment will be based on the accumulation of member contributions, monthly pension payments, interest earned in the DROP period at the regular rate of interest (currently 5%), and any retiree COLAs after at least twelve months in the DROP. Correctional officers and deputy sheriffs hired on or after July 1, 2007 are not eligible to participate in the DROP.

General Employees Deferred Retirement Option Plan (DROP)

Effective July 1, 2007, General employees hired prior to July 1, 2007, are offered a Forward DROP. The DROP allows eligible general employees to elect to receive a lump sum payment at retirement in exchange for a reduced monthly benefit. The DROP period is a minimum of 5 years and a maximum of 10 years. Eligibility is age 55 plus a total of age and service of at least 85. The DROP account will include benefit payments at the maximum option, employee contributions, interest earned in the DROP period at the regular rate of interest (currently 5%), plus any cost-of-living increase granted to retirees, provided the member has been in the DROP for at least 12 months and a one-time credit of unused sick time earned while in the DROP over the member's benefit basis times the member's average final compensation. This program is effective for retirements that occur on or after July 1, 2012. General employees hired on or after July 1, 2007 are not eligible to participate in the DROP.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

DEATH BENEFITS

Ordinary Death Benefit is granted as a result of a member's death from non-occupational causes as follows:

- (A) A general employee's designated beneficiary or estate receives a lump sum payment of the member's contributions plus interest. Additionally, after five years of creditable service, the member's designated beneficiary or estate may receive a one-time payment equal to 100% of the member's annual earnable compensation. If the member was eligible for a service retirement or had 15 years of creditable service at the time of death, the surviving spouse or surviving minor children, if designated as the beneficiary, may receive a retirement allowance, in lieu of other benefit payments, based on service years equivalent to *Option 2*.
- (B) A firefighter's or police officer's designated beneficiary or estate receives a lump sum payment consisting of the member's accumulated contributions plus interest. Additionally, after one year of creditable service, the member's designated beneficiary or estate may receive a one-time payment equal to 100% of the member's annual earnable compensation. If the firefighter or police officer had two years of creditable service, a surviving dependent family member, if designated as the beneficiary, may receive an allowance equal to 25% of AFC in lieu of another benefit. If the firefighter or police officer had 15 years of creditable service or was eligible for a service retirement, the surviving spouse or surviving minor children, if designated as the beneficiary, may receive a retirement allowance in lieu of other benefit payments based on the service years equivalent to *Option 2*.

Accidental Death Benefit is granted as the result of death from an occupational related injury as follows:

- (A) The dependent beneficiary of a general employee may receive an allowance equal to $66\frac{2}{3}\%$ of AFC plus the annuity.
- (B) The dependent beneficiary of a firefighter or police officer may receive an allowance equal to 100% of the annual earnable compensation at the time of death plus the annuity.

TERMINATION BENEFITS

Employees hired prior to July 1, 2007, with 5 or more years of membership service have the option of requesting a refund of their contributions and interest or remain in the System. If such member terminates employment or dies in service, with less than 5 years creditable service, the employee contributions plus interest are refundable to the former member or a designated beneficiary.

Employees hired on or after July 1, 2007, with 10 or more years of creditable service have the option of requesting a refund of their contributions and interest or remain in the System. If such member terminates employment or dies in service, with less than 10 years creditable service, the employee contributions plus interest are refundable to the former member or a designated beneficiary.

POST-RETIREMENT ALLOWANCE INCREASES

Retirement allowance increases can be granted each July 1 if sufficient investment income has accumulated in the Post-Retirement Increase Fund balance account. Increases will be granted in an amount equal to the Consumer Price Index - All Urban Consumers (CPI-U) increase for the previous calendar year. The increase cannot exceed 3%. If there are insufficient funds in the Post-Retirement Increase Fund balance account to finance the full CPI increase, the allowance will be increased to the nearest $\frac{1}{4}\%$ for which there are sufficient moneys. If there are insufficient funds to finance a one percent increase, no retirement allowance increase shall be granted. Effective July 1, 2010 the following changes regarding COLAs were implemented:

- Active members hired prior to July 1, 2007 must have at least 20 years of creditable service to be eligible for post-retirement COLAs.

— ACTUARIAL SECTION —

Summary of Plan Provisions, continued

- Active members hired on or after July 1, 2007 must have at least twenty five (25) years of creditable service to be eligible for post- retirement COLAs.
- The cap on post-retirement COLAs is 3% for all members.
- The maximum account balance in the PRIF is 2 times the cost of a 3% COLA for all members.
- For active members who do not select the Deferred Retirement Option Program (DROP), the eligibility period to receive post-retirement COLAs is a minimum of 60 months.
- For active members who select the DROP program, the eligibility period to receive COLAs in the DROP is a minimum of 12 months. Once the member actually retires, the eligibility period for a post-retirement COLA is a minimum of 48 months.

Changes to Plan Provisions

LEGISLATIVE AND ADMINISTRATIVE CHANGES

On April 10, 2018, the Board of Trustees approved a change in the actuarial valuation period from a fiscal year to a calendar year.

On May 24, 2018, The County Council passed Bill No. 36-18 that, among other items, defined the percentage for “actuarial equivalent” and adopted a mortality table; altered the date contributions rates were to be increased from July 2018 to January 2019; established the valuation rate and provided a method for changing the valuation rate; and provided for a cost of living allowance effective July 1, 2018 that authorized an increase of 3% for retirees and beneficiaries with an annualized gross benefit of less than \$22,000.